



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,178	10/02/2003	Stefan Schneidewind	A36021	8326
21003	7590	10/19/2005	EXAMINER	
BAKER & BOTTS 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			HOLLINGTON, JERMELE M	
			ART UNIT	PAPER NUMBER
			2829	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/677,178

Applicant(s)

SCHNEIDEWIND ET AL.

Examiner

Jermele M. Hollington

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 5 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3-4, 6, 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al (5775416) in view of Vosen (5930456).

Regarding claim 1, Heimanson et al disclose [see Figs. 1 & 2] a test apparatus [see **Note** below] comprising: a vacuum chamber (vacuum chamber 12); an uncooled chuck drive (vertical drive 108) arranged within said vacuum chamber (12); a chuck (chuck 20) carried by said chuck drive (108) [see col. 4, line 45] and thermally decoupled therefrom, said chuck (20) having a receiving surface (cavity 30) for receiving a test substrate (wafer substrate 18), a substrate carrier (annular seat 22) for receiving and holding a substrate (18) to be tested in releasable thermal

Art Unit: 2829

contact with said receiving surface (30). However they do not disclose a thermal radiation shield as claimed. Vosen discloses [see Fig. 1] a test apparatus (system 10) comprising a vacuum chamber (chamber 12) [see also col. 5, lines 62-63], test substrate (wafer 14), a substrate carrier (substrate holder 15) and a directly cooled thermal radiation shield (window 32) arranged to shield said test substrate (14) from thermal radiation [see col. 6, lines 62-66]. Further, Vosen teaches that the addition of thermal radiation shield is advantageous because prevents thermal radiation and contamination from entering the chamber and to prevent a direct path from a light source to sensing port on the substrate. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Heimanson et al by adding thermal radiation shield as taught by Vosen in order to prevent thermal radiation and contamination from entering the chamber as well as to prevent a direct path from a light source to sensing port on the substrate.

[**Note:** The recitation “for testing substrates at low temperatures” has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).]

Regarding claim 3, Heimanson et al disclose said chuck (20) is connected to said chuck drive (108) by means of an intermediate part (chuck body 56) made from a material with a lower thermal conductivity than metal.

Regarding claim 4, Vosen discloses said thermal radiation shield (32) has a through opening in the center.

Art Unit: 2829

Regarding claim 6, Heimanson et al disclose there are provided probe holders (clamp 52), which are thermally conductively connected to the chuck (20).

Regarding claim 8, Heimanson et al disclose said substrate carrier (22) is carried by a mounting arrangement (clamp 32) which includes a vertically movable member which is thermally connected to the cooled chuck (20), and a holding pin [not number but shown in Fig. 2], which is mounted to the chuck drive (108) [via chuck body 56] and consists of a material with a lower thermal conductivity than metal.

Regarding claim 9, Heimanson et al disclose the chuck (20) comprises a chuck body (chuck body 56) with a chuck surface (plate 36b) and a chuck plate (plate 36a), which rests on the chuck surface over its entire area and can be detached from the chuck body (56).

Regarding claim 10, Heimanson et al disclose cooled parts (cooling unit 34) of the chuck (20) and of the thermal radiation shield (32 of Vosen wherein the cooled parts are cooling conduits 16) consist of material with a good thermal conductivity, and the cooled parts (34) of the chuck (20) have highly reflective surfaces.

Regarding claim 11, Heimanson et al disclose the chuck (20) has a chuck heater (heating unit 24).

Regarding claim 12, Vosen discloses the thermal radiation shield (32) has a shield heater (heating device 22) [see col. 6, lines 8-27].

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heimanson et al in view of Vosen as applied to claim 1 above, and further in view of Hollman (6198299).

Regarding claim 2, Heimanson et al and Vosen both disclose said vacuum chamber (12 of both references). However, they do not disclose vacuum chamber with an inspection opening as

claimed. Hollman discloses [see Fig. 2] a test apparatus (system 10) comprising chuck drive (combination of x-y prober platform 46 and x-y stage 17), a chuck (wafer chuck 14) carried by said chuck drive (46 and 17), a substrate carrier (shown but not numbered in Fig.) for receiving and holding a test substrate (DUT 50) and a vacuum chamber (vacuum chamber 26) with an inspection opening (not numbered but shown in Fig.) on top wall (chamber top 28) lying opposite a top side of said chuck (14). Further, Hollman teaches that the addition of vacuum chamber with an inspection opening is advantageous because it helps any type inspection equipment (such as scanning probe microscope) to observe a surface of the device under test for identifying the electrically conductive terminals for the positioning of probes. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of Heimanson et al in view of Vosen by adding an inspection opening to the vacuum chamber as taught by Hollman in order to observe a surface of the device under test for identifying the electrically conductive terminals for the positioning of probes.

Conclusion

Response to Arguments

1. Applicant's arguments filed August 4, 2005 have been fully considered but they are not persuasive.

a) Regarding claim 1, the applicants' argue: "*Claim 1 of the present application recites, inter alia, an uncooled chuck drive arranged within said vacuum chamber. Heimanson does not disclose a chuck drive arranged within a vacuum chamber, but instead discloses a chuck that is supported on a vertical drive such that bellows seal the chuck body to a vacuum chamber while permitting vertical movement of the chuck. (See Heimanson, col. 4, lns. 45-50). As shown in Figure 1 of Heimanson, the bellows are needed to seal the chuck body*

Art Unit: 2829

to the vacuum chamber while permitting vertical movement because the vertical drive is not arranged within the vacuum chamber. (See Heimanson, Fig. 1). Vosen does not cure the deficiencies of Heimanson."

In response to the above arguments, the examiner disagrees. In MPEP 2111, it states: *"During patent examination, the pending claims must be "given their broadest reasonable interpretation..." In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000)."* In reviewing the prior art, Heimanson et al do disclose that the vertical driver 108 is within the vacuum chamber. In col. 4, lines 45-50 it states: "The chuck 20 is supported on a vertical drive 108 for raising and lowering the wafer substrate 18 within the vacuum chamber. Bellows 110 seal the chuck body 56 to the vacuum chamber 12 while permitting the relative vertical movement of the chuck 20." The top portion of the vertical drive 108 is within the chamber to move the chuck 20 while the bellows are used to seal around the driver 108 to keep the temperature inside the chamber. If the top portion of the driver is not within the chamber, then the chuck would not be able to move as described. Further, if the driver 108 were not within the chamber, then the driver would be moving the chamber itself and not the chuck.

b) Further, the applicants argue: *" Claim 1 of the present application further recites, inter alia, a chuck carried by said chuck drive and thermally decoupled therefrom. Heimanson does not disclose a chuck thermally decoupled from a chuck drive, but instead discloses a vertical drive that is directly coupled to a chuck body, although the material coupling the two devices is not disclosed. (See Heimanson, Fig. 1)..."*

In response to the above arguments, the examiner disagrees. In reviewing Heimanson et al, the chuck 20 is thermally decoupled from the vertical drive 108 by bellows 110. As stated in col. 4, lines 47-51: "Bellows 110 seal the chuck body 56 to the vacuum chamber 12 while permitting the relative vertical movement of the chuck 20. Preferably, a plurality of bellows (not shown) provides separate exits from the vacuum chamber 12 for the conduits 64 and 74." It seems the bellows 110 are used to seal around the

Art Unit: 2829

driver 108 to keep the temperature inside the chamber. Further, if the chuck were not thermally decoupled from the driver 108, then both the driver 108 as well as the chuck 20 would be heated at the same time. In reviewing Heimanson, he does not disclose that the driver 108 is being heated with the chuck 20. Therefore, the driver 108 has to be thermally decoupled from the chuck 20.

5. Claims 5 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: regarding claim 5, the primary reason for the allowance of the claim is due to a through opening in a thermal radiation shield having a transparent closure that filters light of selected wavelengths.

Regarding claim 7, the primary reason for the allowance of the claim is due to probe holders in a vacuum chamber that are thermally conductively connected to the thermal radiation shield.

Since the examiner has not changed the Office Action of Feb. 11, 2005, the following is being applied.

7. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

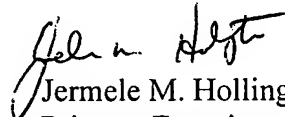
Art Unit: 2829

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermele M. Hollington whose telephone number is (571) 272-1960. The examiner can normally be reached on M-F (9:00-4:30 EST) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (517) 272-2034. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jermele M. Hollington
Primary Examiner
Art Unit 2829

JMH
October 17, 2005